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TRANSMISSION SYSTEM VEGETATION MANAGEMENT PROGRAM

Final Environmental Impact Statement - Summary
DOE/EIS-0285

Arrow-leaf Balsamroot

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Cooperating Agencies

BONNEVILLE POWER ADMINISTRATION

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Summary

In this summary:

- **Purpose, Need, and Issues**
- **Methods and Their Impacts**
- **Planning Steps**
- **Program Alternatives and Their Impacts**

Purpose, Need, and Issues

Need

Bonneville Power Administration (Bonneville) is responsible for maintaining a network of 15,000 miles of electric transmission lines and 350 substations. This electric transmission system operates in seven states of the Pacific Northwest. (See Figure S-1.)

Those states offer a great diversity of vegetation (from trees to brush to grasses), which can interfere with electric power flow, pose safety problems for us and neighboring members of the public, or interfere with our ability to maintain our system. **We need to keep vegetation a safe distance away from our electric power facilities and control noxious weeds at our facilities**. Bonneville's vegetation management program is the policy and direction for managing vegetation throughout our service area.

Our electric facilities include the following:

- **rights-of-way** (transmission lines and access roads),
- **electric yards** (such as substations), and
- **non-electric facilities** (such as maintenance headquarters).

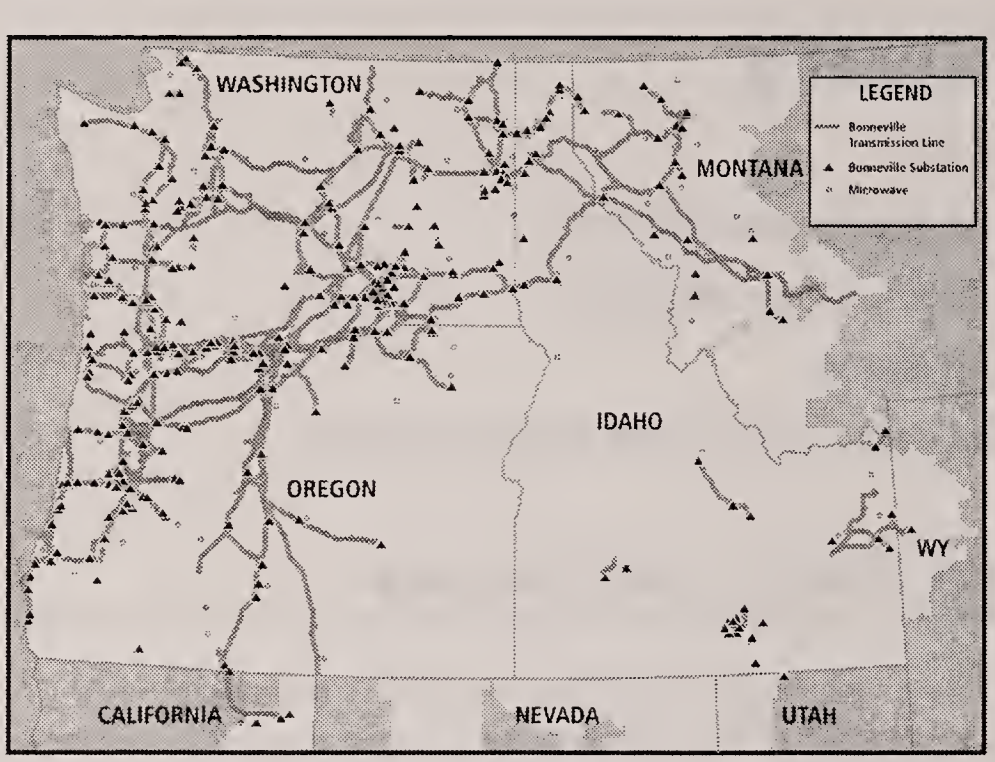
Purposes

While managing vegetation around our facilities, we must also balance other **purposes** or objectives. These purposes are to

- minimize adverse environmental impacts,
- achieve cost and administrative efficiency, and
- comply with laws and regulations.

Summary

Figure S-1: Bonneville Service Territory



Reasons for This EIS

In 1983 we prepared an environmental impact statement (EIS) on our vegetation management program. Since that time some important things have occurred:

- We need to increase our program efficiency and consistency.
- Herbicide use is under increased public scrutiny.
- There is more emphasis on using Integrated Vegetation Management (IVM) approaches.

This EIS proposes various alternatives that respond to these factors.

Efficiency and Consistency

This EIS represents an "umbrella" document: it sets forth a framework of Planning Steps and mitigation measures to increase efficiency and consistency when we undertake a specific project in, say, eastern Oregon or northern Idaho. It also explores, identifies, and discloses many of the commonly occurring environmental issues or impacts expected from vegetation management.

When we plan a **specific** project, we would then "tier" the site-specific environmental analysis to this EIS by

(1) using the Planning Steps to ensure consideration of all potential issues,

(2) consulting with this EIS to determine whether impacts had been previously considered, and

(3) applying the appropriate established mitigation measures.

We would document our findings in a *Supplement Analysis*. If anticipated impacts, project components, knowledge, or circumstances were to differ substantially from those evaluated in this EIS, we would undertake more, broader environmental analysis.

Herbicide Use

Herbicide use is an important focus in this EIS. Scrutiny of chemicals used to control insects or vegetation has increased through the years. In the late 1980s, we drastically reduced herbicide use on rights-of-way. However, it has since been very difficult to keep up with the growth of deciduous trees, which resprout and grow quickly, multiplying our maintenance work.

This EIS describes the advantages and disadvantages of herbicide use. The alternatives were designed to help determine, among other things, whether to use herbicides and, if so, to what extent.

Integrated Vegetation Management (IVM)

Integrated Vegetation Management (IVM) is a strategy to cost-effectively control vegetation with the most benign overall long-term effect on public health and safety and the ecosystem. IVM tries to maximize favorable effects and minimize potential negative effects.

The utility industry has had continuing success in applying an IVM strategy for managing rights-of-way vegetation. **All of our right-of-way alternatives will use the IVM concept: we will use an array of control methods, choosing methods or combination(s) of methods based on the vegetation needing control, cost-effectiveness, and the environmental conditions present**.

The ultimate goal for IVM right-of-way management is to convert the right-of-way to low-growing plant communities that keep tall-growing vegetation out. Low-growing plants can often "out-compete" trees and tall-growing brush for sunlight and nutrients.

Decisions to Be Made

Several decisions will be made through this EIS document and process:

1. Which management approach should Bonneville adopt for maintaining rights-of-way? *(Bonneville proposes to adopt an approach that promotes low-growing plant communities.)*
2. What methods should Bonneville have available for use for managing right-of-way vegetation? *(Bonneville proposes to have a full range of methods available for use: manual, mechanical, biological, and herbicide [spot, localized, broadcast, and aerial].)*

3. If Bonneville decides to use herbicide methods, on what kinds of vegetation should they be applied? *(Bonneville proposes to be able to apply herbicides to all vegetation types.)*
4. Should we continue to manage electric-yard vegetation as we do currently? *(Bonneville proposes to continue the current practice of using herbicide.)*
5. What methods should Bonneville use for managing non-electric-facility vegetation? *(Bonneville proposes to continue with the current practice of using a range of methods, including manual, mechanical, biological, and herbicides.)*

We will base our decisions on the findings contained in this EIS (weighing how each choice meets our need and purposes) and the consideration of public comments and recommendations. The Bonneville Administrator will decide which alternatives to adopt. The decision, the reasons behind it, and the conditions for it will be presented in a document called the *Record of Decision (ROD).*

Cooperating Agencies

The U.S. Forest Service (FS; U.S. Department of Agriculture) and the Bureau of Land Management (BLM; U.S. Department of the Interior) are cooperating agencies in the development of this EIS. About 1,400 miles of Bonneville's transmission-line corridors and a number of Bonneville substations are located on lands managed by either the FS or BLM. We all have strong interests in how vegetation and land along these corridors is managed. Agency cooperation should help Bonneville analyze or coordinate vegetation management work on BLM or FS land in an effective, efficient, consistent, and timely way.

The Methods and Their Impacts

Bonneville is considering four **general control methods** that can be used individually or in combination to control vegetation**:**

- manual (chainsaws, pulling, etc.)
- mechanical cutting (heavy equipment such as mowers and choppers),
- biological control agents (for noxious weeds), and
- herbicides and growth regulators.

For herbicides, we are considering 23 **herbicide active ingredients** and 4 **application techniques: spot, localized, broadcast, and aerial.**

These methods and techniques, in various combinations, make up the alternative vegetation management programs.

Manual Control Methods

Manual techniques can be highly selective, cutting only targeted vegetation. The short-term impact of chainsaw noise can disturb wildlife and neighbors.

Worker health and safety issues center on the safety impacts of hiking along the right-of-way, carrying and using chainsaws and other tools, and felling trees. It is hard to control vegetation manually where the vegetation is dense, in remote locations, or in steep terrain. This method also creates lots of debris.

When deciduous trees are cut, they usually resprout with *more* stems than before, creating even more dense vegetation. Successive cuttings significantly increase the amount and difficulty of labor needed to complete vegetation control.

Manual vegetation control costs from $70 to $700 per acre.

Mechanical Control Methods

Mechanical methods are very effective for completely removing thick stands of vegetation. Most mechanical techniques are non-selective: they tend to clear or cut all vegetation within the path. They are not desirable for selective vegetation removal.

In general, mechanical methods that disturb soil (heavy equipment or scraping actions) are not appropriate to use near water bodies or wetlands, on steep slopes, or in areas of soft soils. Soil can be compacted and eroded. Subsurface cultural artifacts can be disturbed or destroyed.

Heavy machinery noise, exhaust, and dust associated with many mechanical methods can disturb wildlife and neighbors. As with manual methods, cutting deciduous trees produces resprout problems, creating more dense vegetation and more work. Health and safety issues of using heavy equipment include vehicle accidents and flying debris.

Mechanical vegetation control costs from $100 to $600 per acre.

Biological Control Methods

Biological control methods (insects or pathogens) are used to weaken or destroy noxious weeds. Most noxious weeds originate in other countries and gain a competitive advantage over native plants because they have no natural enemies in the new location. With biological controls, selected natural enemies of a weed are introduced and managed to control weed spread.

Biological controls cause little potential environmental impact. Insects eat or stress weeds so they die without disturbing soil or other plants. The use of insects also does not create the intrusive human presence that mechanically or manually clearing noxious weeds does; insect use also does not have the potential contamination issues of herbicides. However, biological control is a slow process, and its effectiveness varies widely.

Health and safety impacts are limited to transporting insects to the site, hiking along the right-of-way, and potential helicopter accidents with aerial release of insects.

Biological vegetation control costs range from $80 to $150 for ground applications of insects to noxious weed areas, and $150 to $275 for aerial drop.

Herbicide Control Methods: Active Ingredients

Herbicides kill or damage plants by inhibiting or disrupting basic plant processes. Herbicides are most often applied in mixtures with water or oil carriers, various adjuvants (wetting or sticking agents, stabilizers or enhancers, etc.), and/or dyes needed for application or environmental monitoring.

As with all herbicides sold in the United States, Bonneville uses only those herbicides that have been approved by the Environmental Protection Agency (EPA). All those who use such chemicals are required by law to follow the label directions on the manufacturer's herbicide container— "the label is the law." Bonneville's herbicide treatments comply with the EPA-reviewed and -approved manufacturers' instructions printed on the label.

Bonneville is considering the following 23 different active herbicide ingredients to be available for use in those Program Alternatives that use herbicides.

2,4-D	Fosamine ammonium	Oryzalin
Azafenidin	Glyphosate	Paclobutrazol
Bromacil	Halosulfuron-methyl	Picloram
Chlorsulfuron	Hexazinone	Sulfometuron-methyl
Clopyralid	Imazpyr	Tebuthiuron
Dicamba	Isoxaben	Triclopyr
Dichlobenil	Mefluidide	Trinexapac-ethyl
Diuron	Metsulfuron-methyl	

- Seventeen of these herbicides could be used for rights-of-way (Right-of-way Program).
- Seven herbicides could be used for electric yards (Electric Yard Program).

- Eleven herbicides could be used for non-electric facilities (Non-electric Program).

Some of the herbicides have multiple uses and can be used in more than one program. EPA uses a toxicity rating system for herbicides, from "Category I" (highly toxic) to "Category IV" (practically non-toxic). Most of the toxicity ratings of the herbicides proposed in this EIS fall into the categories "slightly toxic" or "practically non-toxic."

Herbicide Control Methods: Application

Herbicides can be applied in different ways, depending on the plants that are targeted, the density of the vegetation, and site circumstances. They fall into the following four categories:

- **Spot** (herbicide applied to individual plants—stump treatment, injection into tree),
- **Localized** (treatment of individual or small groups of plants - backpack spray, granular, or all terrain vehicle [ATV]),
- **Broadcast** (treatment of an area with truck, or ATV, granular), and
- **Aerial** (treatment of an area with a helicopter or plane).

Depending on the type of herbicide and the application technique, herbicides can be **selective** (affecting only the targeted vegetation) or **non-selective** (affecting all the vegetation in its path),

Because herbicides tend to kill the roots of the vegetation, there is less chance for resprouting to occur; therefore, the treatment is effective for a longer term than with plain cutting. Short-term effectiveness is not always apparent (as with mechanical or manual methods). Often an area must be reviewed months later to see whether the target vegetation was treated and affected (sometimes dyes are used to help determine whether a plant was treated). In other cases, the effects are visible in days.

After most herbicide treatments, dead vegetation is left standing, so there is no debris disposal. Standing dead vegetation can provide both an eyesore (where it is seen) and some wildlife cover.

Environmental concerns of herbicide treatments include the potential of herbicide drift, leaching to and affecting non-targeted vegetation or water sources, and potentially affecting fish and wildlife. Along the right-of-way there is usually little potential for herbicides to affect

these resources because the amount of herbicide active ingredient actually used is small and because there is a long time span between treatments (3 to 10 years). In electric yards, herbicides are used more often (once a year), so there is more potential for spills, leaching, or surface runoff. Buffer zones are necessary so that herbicides will not reach water bodies. Care must be taken not to apply granular herbicide in areas where surface runoff is likely to occur. Herbicides should not be used next to organic farming.

Health and safety issues include the toxicity and potential long-term affects of the inert and active ingredients, carriers, and adjuvants. Workers—who are most likely to be exposed to large quantities and repeatedly—need to take precautions when handling herbicides (as specified on labels: that is, they should wear gloves, change clothes after use and before eating, and so on). Public health and safety issues include the potential effects of exposure, particularly one-time exposure. Although there is some public use of the right-of-way, only rarely might someone be accidentally sprayed or water sources be contaminated.

Spot and localized herbicide treatments work well in treating deciduous stumps to keep them from resprouting or in small areas needing vegetation control along a right-of-way or around a non-electric facility. Because of the selective nature of spot applications, vegetation in environmentally sensitive areas can be treated with less impact than other application methods.

Broadcast herbicide treatment is more appropriate for densely vegetated areas that are accessible by truck (such as along access roads). Broadcast methods are also appropriate in electric yards where total vegetation management is desirable.

Aerial spraying is appropriate in remote areas that are difficult to access by hiking (although there needs to be an accessible landing site for both the helicopter and the water-herbicide mix truck). Aerial herbicide treatment is also well-suited for areas of dense tall vegetation, where it is difficult to walk through and the foliage is high and not accessible by broadcast or backpack spray.

The costs of **spot and localized** herbicide treatments methods are $35 - $140/per acre. The cost of **broadcast** herbicide treatments are $150 - $250/per acre. The costs of **aerial** herbicide treatment are $20 - $160/per acre.

Debris Disposal

Managing vegetation includes clean-up—the treatment of slash and debris disposal. There are four basic methods:

- **Chipping:** a machine chips vegetation and spreads it on the right-of-way, piles chips, or hauls them off-site ($175 - $250/acre);
- **Lopping and Scattering:** branches are cut off a tree so that the trunk lies flat on the ground in 1-to-2-m (4-to-8-ft.) lengths; cut branches and trunks are then scattered on the ground ($75 - $125/acre);
- **Mulching:** produces bigger pieces than chipping, smaller than lop-and-scatter; these are scattered on ground ($175 - $275/acre); and
- **Pile Burning:** vegetative debris is piled *off* the right-of-way (burning is a hazard in the right-of-way) and burned in small piles ($90-$125/acre).

Reseeding and Replanting

Reseeding and replanting are done for several reasons:

1. to control soil erosion,
2. to prevent the establishment of noxious weeds,
3. to help establish low-growing vegetation,
4. to promote wildlife habitat,
5. to mitigate visual impacts.

Approving New Techniques for Use

As part of an IVM strategy, Bonneville would adopt new techniques or herbicides for vegetation control that are more effective, safer or more environmentally benign, as appropriate.

To do this, we would review the effectiveness of the technique/herbicide, the cost to use it, and the potential environmental impacts it might cause (including appropriate consultations to determine impacts). This information would be gathered in a *Supplement Analysis*. We would notify the public and solicit comment on the new technique or herbicide. We would compare the impacts of the technique or herbicide with those disclosed here. If the impacts were equivalent to, and safer or more environmentally benign than the ones discussed in this EIS, then the new technique/herbicide could be added as a tool for use in our program.

If the impacts were substantially *different* from those discussed in this EIS, we would either not approve its use or conduct further environmental review in order to make an informed decision as to whether we should approve and add the tool to our program.

Methods Eliminated from Consideration

Two vegetation control methods were eliminated from further consideration for Bonneville's vegetation management program:

- **Grazing** (using livestock to eat the vegetation) is only "somewhat" effective, and logistics (supplemental feed, water, containment, and predators) limit the usefulness of this method.
- **Prescribed fire** (burning an area to control vegetation) is dangerous because smoke and hot gases from a fire can create a conductive path for electricity, and electric arcs can endanger people and objects, and cause the line to go out.

Site-specific Planning Steps and Mitigation Measures

Site-specific Planning Steps will be a tool for ensuring that environmental aspects are considered as part of an integrated vegetation management strategy and under the National Environmental Policy Act (NEPA).

The **Planning Steps** are as follows:

1. **Identify facility and the vegetation management need.**
2. **Identify surrounding land use and landowners/managers.**
3. **Identify natural resources.**
4. **Determine vegetation control methods.**
5. **Determine debris disposal and revegetation methods, if necessary.**
6. **Determine monitoring needs.**
7. **Prepare appropriate environmental documentation.**

Each Planning Step has a set of **mitigation measures** used to avoid or reduce potential environmental impacts on the environment, and to allow for safe operation and maintenance of the transmission system. (Not all measures would be appropriate for all program alternatives.) Those measures include consultations, when appropriate, for species identified as threatened or endangered under the Endangered Species Act, applying herbicide-free buffer zones near water bodies, contacts with landowners along the rights-of-way, following herbicide label requirements (safety, weather restrictions, drift reduction measures, etc.), limiting mechanical use on steep or wet soils, and others.

Bonneville would adhere to all requirements and permits in undertaking these steps.

Program Alternatives and Their Impacts

Bonneville is considering three different programs, each with its own set of alternatives.

- **Right-of-way Program Alternatives** (Management Approaches MA1 & MA2; Method Packages R1, R2, R3, & R4; Vegetation Selections VS1, VS2, & VS3).
- **Electric Yard Program Alternative** (E1)
- **Non-electric Program Alternatives** (NE1 & NE2)

Right-of-way Program Alternatives

The right-of-way program includes vegetation management on transmission-line rights-of-way and access roads, and along microwave beam paths. This program has three sets of alternatives that can be combined in different ways to create an overall right-of-way program.

Alternative MA1 – Time-Driven *(current practice)*

This management approach maintains right-of-way vegetation in repetitive maintenance cycles. Each cycle, we would clear or treat the right-of-way to try to ensure that no vegetation would threaten the transmission line or block access until the next cycle of treatment. This approach could use herbicides, or not.

Impacts with this approach include saplings growing within the corridor between each cycle, requiring the same or increasingly intensive maintenance with each maintenance cycle. The right-of-way would be repeatedly disturbed: this would include habitat, noise, and soil and non-target plant disturbance. Method-specific impacts would depend on the methods used. This alternative does not *require* the use of herbicides, and therefore could eliminate potential impacts associated with herbicide use.

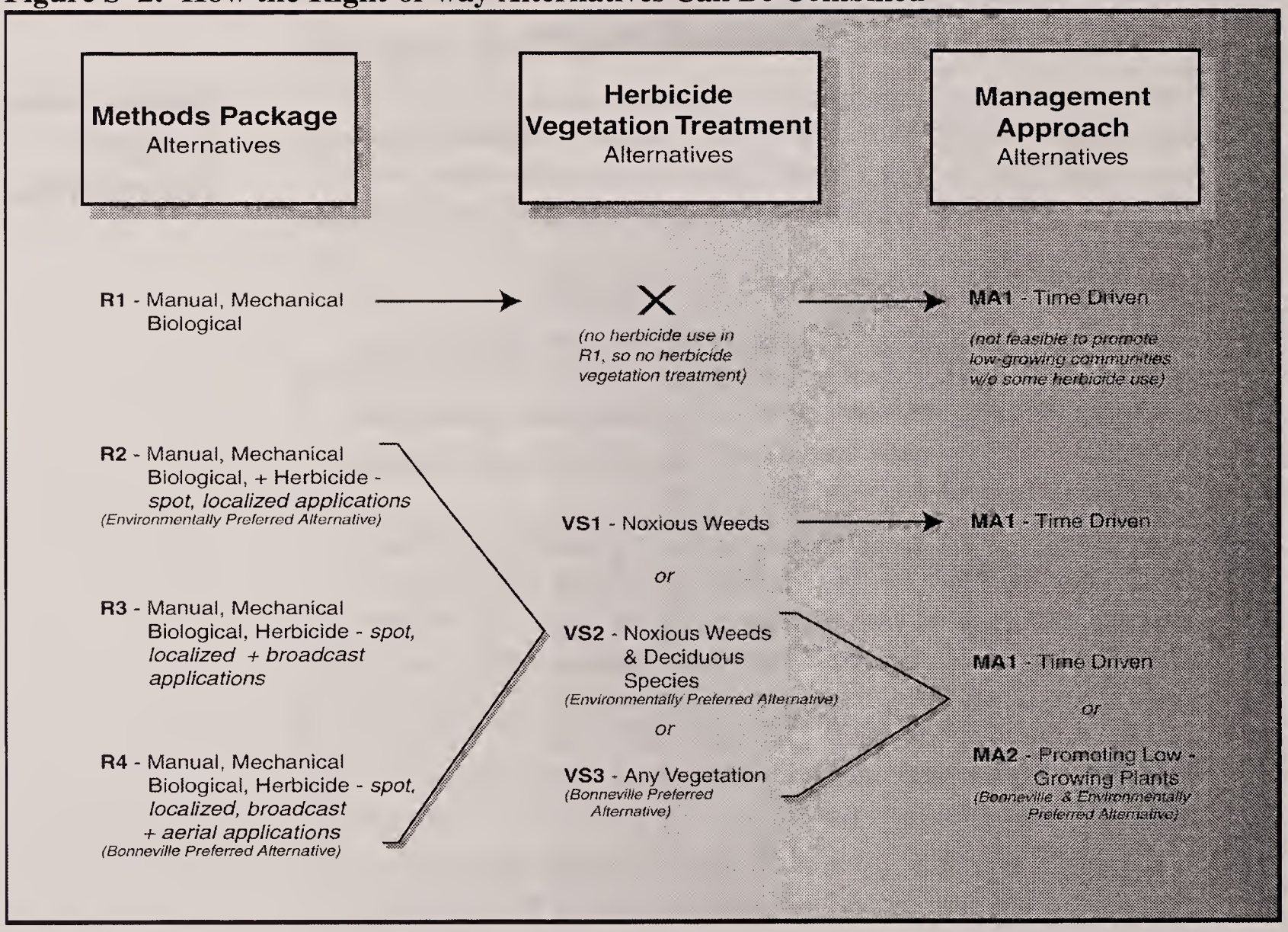
This alternative would cost less than MA2 (Promotion of Low-growing Plant Communities) initially, but more in the long term.

Alternative MA2 – Promotion of Low-growing Plant Communities *(Bonneville preferred & environmentally preferred alternative).*

MA2 seeks to promote the establishment of low-growing plant communities on the right-of-way to "out-compete" trees and tall-growing brush.

Promoting low-growing plant communities would be done by protecting low-growing plants from disturbance during maintenance and from competing tall-growing vegetation so that low-growers can establish and propagate. This alternative requires the use of at least spot-herbicide treatment to treat deciduous species to prevent resprout.

Figure S–2: How the Right-of-way Alternatives Can Be Combined



Impacts associated with this approach would decrease over time: less intensive maintenance and right-of-way disturbance would be required. Method-specific impacts would depend on the methods used. Because

at least some herbicides would be used to help control the resprouting of deciduous species, impacts include potential herbicide impacts.

This alternative would probably cost more than Alternative MA1 in the short term, but would be less expensive in the long term.

Alternative R1 – Manual, Mechanical, Biological

With this methods package alternative, most of the right-of-way would be managed manually, through chainsaw cutting of tall-growing vegetation. Mechanical control would be used in areas where vegetation was extremely dense, possibly on access roads where low brush can be a hindrance, and around tower structures. Many noxious weed areas could not be treated with this alternative; those areas that could treated would have biological, manual, and a small amount of mechanical means used.

Impacts of this alternative include those for manual, mechanical, and biological methods. In the long term, increased impacts would occur as vegetation resprouted.

Environmental impacts are more drastic when densely vegetated areas are cleared, compared to the selective removal of trees or brush. More habitat is affected, more soil is disturbed, non-target plants that have grown in shade-tolerant situations are suddenly exposed, human presence on the right-of-way is increased, and visual impacts are more sudden and more dramatic.

This alternative would cost more to implement than Alternatives R2, R3, or R4.

Alternative R2 – Manual, Mechanical, Biological + Herbicide – *spot and localized application*. *(Environmentally preferred alternative)*

With R2, as with all of the alternatives, most of the right-of-way would still be managed manually: we would use chainsaws to cut tall-growing vegetation. About half of those areas manually cut would receive follow-up spot herbicide treatments on deciduous vegetation. *Herbicide use for tall-growing vegetation depends on the selection of Alternatives VS2 (noxious weeds and deciduous), or VS3 (any vegetation).*

We would also use localized herbicide treatments, a relatively small amount of spot treatment (not used in conjunction with cutting), and some mechanical methods. By adding herbicide methods, manual methods would be used somewhat less than with R1.

Noxious weeds would be treated mainly via localized herbicide applications (backpack or ATV-mounted sprayers), with some biological methods, and little to no manual and mechanical methods. There would still be some areas or weeds that could not be treated.

Environmental impacts of this alternative include those for manual, mechanical, biological, and herbicide use (spot and localized techniques). In the long term, this alternative could be able to control resprouting of deciduous plants, reducing the amount of regrowth along rights-of-way.

This alternative would cost less to implement than Alternative R1 and more than R3 and R4.

R3 – Manual, Mechanical, Biological, Herbicide – *spot, localized + broadcast application*

This alternative varies only slightly from R2: most of the right-of-way would still be managed manually. Nearly half of those areas manually cut could receive follow-up spot herbicide treatments (deciduous vegetation). *Herbicide use for tall-growing vegetation depends on the selection of Alternatives VS2 (noxious weeds and deciduous), or VS3 (any vegetation).*

Localized herbicide treatments, a relatively small amount of broadcast herbicide, spot herbicide treatment (not used in conjunction with cutting), and mechanical methods would also be used. Half of the mechanical treatments could also receive a subsequent broadcast herbicide treatment.

Noxious weeds would still mostly be treated with localized herbicide applications, with some broadcast application being used instead of localized or spot treatments. There would still be untreatable areas.

Environmental impacts of this alternative include those for manual, mechanical, biological, and herbicide use (spot, localized and broadcast techniques). In the long term, this alternative could be able to control resprouting of deciduous plants, reducing the amount of regrowth along rights-of-way.

The costs of this alternative would slightly less than those of R2.

R4 – Manual, Mechanical, Biological, Herbicide – *spot, localized, broadcast + aerial application*. *(Bonneville preferred alternative)*

Under R4, most of the right-of-way would still be managed manually. Nearly half of those areas manually cut could receive follow-up spot herbicide treatments (deciduous vegetation). *Herbicide use is dependent on the selection of Alternatives VS2 (noxious weeds and deciduous), or VS3 (any vegetation).*

Localized herbicide and aerial herbicide treatments, some spot treatment (not used in conjunction with cutting), broadcast herbicide applications, and mechanical methods would also be used. Half of the mechanical treatments would also receive a subsequent broadcast herbicide treatment. The addition of aerial spraying would reduce reliance on manual methods, manual-with-spot-herbicide treatments, and localized treatments.

This program alternative offers the widest range of choices for methods to be used—the greatest number of "tools" in the tool box—when determining the appropriate method to manage the vegetation along any given right-of-way.

Environmental impacts of this alternative include those for manual, mechanical, biological, and herbicide use (spot, localized, broadcast and aerial techniques). In the long term, this alternative could be able to control resprouting of deciduous plants, reducing the amount of regrowth along rights-of-way.

The costs of this alternative would be quite a bit less than those for R1, R2 and R3.

Alternative VS1 – Noxious Weeds

With this vegetation selection alternative, we would use herbicides only for treating noxious weeds. This alternative would allow us to be in compliance with controlling noxious weeds (it is difficult to control noxious weeds without herbicides).

The environmental impacts from herbicide use would be limited to *only* those areas treated for noxious weed invasion. Because herbicides would not be used on deciduous species, there would be environmental impacts associated with the increased maintenance needed to clear resprouting vegetation.

Alternative VS2 – Noxious Weeds & Deciduous *(Environmentally preferred alternative)*

With this alternative, only noxious weeds and deciduous resprouting/suckering-type plant species could be treated with herbicides. Noxious weeds could be adequately addressed, as could the major issue of treating deciduous resprouting vegetation. We would therefore be able to promote low-growing plant communities along the right-of-way.

The environmental impacts of this alternative would include those associated with the use of herbicides in areas with deciduous species. There would be fewer general maintenance impacts (compared to VS1), because deciduous vegetation would be treated.

Alternative VS3 – Any Vegetation *(current practice — Bonneville prefered alternative)*

With VS3, we would be able to choose to treat any target vegetation with herbicides. Noxious weed issues could be addressed, deciduous species could be controlled, and there would be added flexibility in how a right-of-way would be managed. Being able to treat any vegetation allows for the option to injection-treat a stand of conifers in the right-of-way and leave the dead trees standing for habitat, while also eliminating the costs and the impacts on non-target plants from felling trees, chopping them up, and disposing of them.

There would be more potential environmental impacts associated with herbicide use and fewer potential impacts associated with other methods. The extent of maintenance needed would be the same as those under VS2 and less than those under VS1.

Electric Yard Program Alternative

The Electric Yard Program includes substations, electric yards, and sectionalizing switches.

Alternative E1 – Herbicide Treatment *(current practice, Bonneville preferred)*

To control vegetation in electric yards, we would mostly use pre-emergent herbicides, which are applied to the ground to keep vegetation from germinating. Herbicides would be applied about once a year. For the few cases where vegetation *is* able to grow within the electric yard, we would use a follow-up post-emergent herbicide, weed burners, steamers, or selective hand-pulling. These post-emergent methods have potential safety issues, but are necessary in cases of sprouted vegetation.

Any potential environmental impacts associated with keeping an electric yard free of weeds would be those resulting *if* any herbicides were to migrate off-site.

Eliminated from Consideration

For safety reasons, we eliminated from consideration the alternative of *not* relying on pre-emergent herbicides in electric yards. If we did not use pre-emergent herbicides, people would have to treat all vegetation after it has sprouted. A plant in an electric yard has to grow up through a metal ground mat and could provide another grounding path for electricity. If a person were to come in contact with a plant in the yard during a fault in or near the substation, he or she could be electrocuted.

Non-electric Program Alternatives

The Non-electric Program includes facilities that have landscaping and gravel work yards or parking lots.

Alternative NE1 – Mixed Methods with Herbicides *(current practice, Bonneville preferred alternative)*

This alternative maintains landscaping manually, uses herbicides to suppress weeds, and applies fertilizers.

The associated potential environmental impacts would come from possible herbicide movement off lawns, gravel yards, and general landscaping; and noise and pollution from lawn movers, weed whackers, and leaf blowers. There is no potential environmental impact from hand hoeing, clipping, or weed pulling.

This alternative would cost less than NE2.

Alternative NE2 – Non-herbicide Methods *(Environmentally preferred alternative)*

This alternative would manage vegetation landscaping and vegetation at other non-electric facilities without using any herbicides. We would use manual methods (hoes, saws, clippers), mechanical methods (lawn mowers), and fertilizer.

Environmental impacts would include the potential spread of noxious weeds, visual impacts, noise and pollution.

This alternative would cost more than NE1.

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